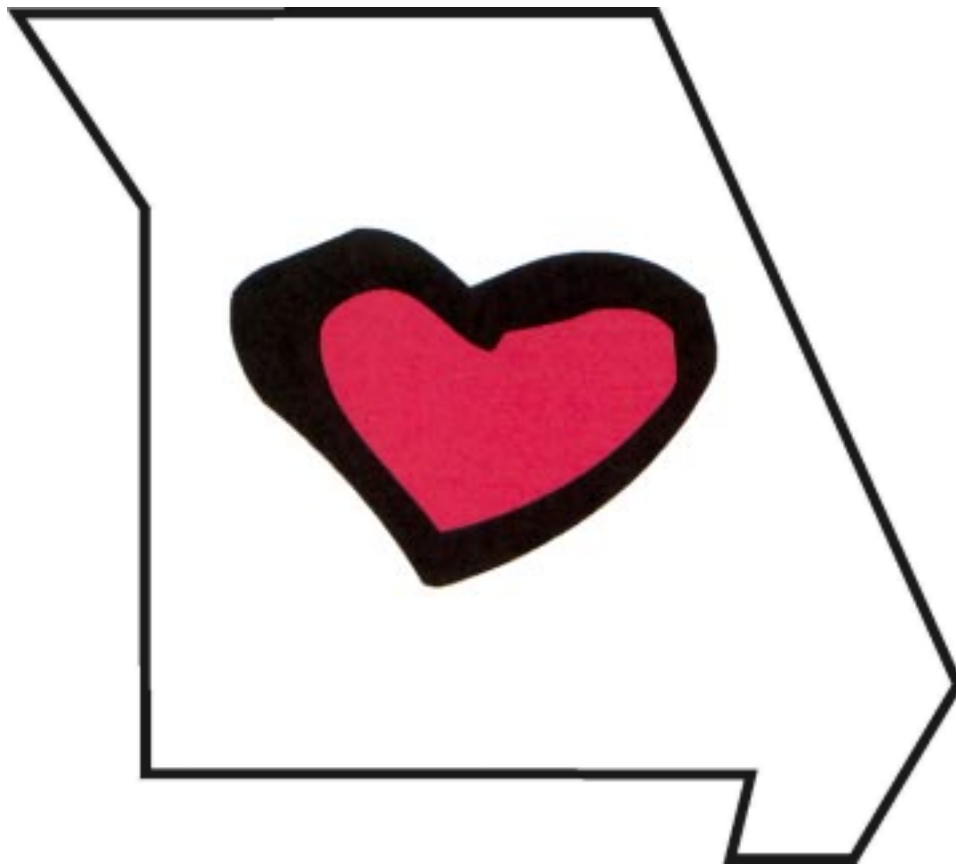


The Missouri *Cardiovascular Health State Plan* **2000-2010**



**Cardiovascular
Health**

Bureau of Chronic
Disease Control



Foreward

The *Missouri Cardiovascular Health State Plan* was developed by the Missouri Department of Health and Senior Services Cardiovascular Health Program, with the support and guidance of the Cardiovascular Health Advisory Board. The purposes of the Plan are to raise awareness of cardiovascular disease (CVD) as the primary killer in Missouri and to coordinate the efforts of statewide partners in implementing activities and policies that affect CVD and its risk factors. The Plan includes reference to the 1991 State Plan, background information on the burden of CVD in Missouri, CVD risk factors, and highlights priority populations at high risk of suffering the consequences of this disease. The Plan also establishes goals and objectives that provide a framework for coordinating the efforts of statewide partners toward outcomes that will hopefully reduce the mortality and morbidity associated with CVD.

As the leading cause of death, CVD has a devastating impact on the health of Missourians. In 1997, CVD accounted for more than 22,000 deaths. These deaths need not occur as many of the risk factors associated with CVD are controllable, making CVD largely preventable. Thousands of people can reduce their risk of developing and dying from CVD by being regularly active, eating a healthy diet, quitting smoking, and keeping their blood pressure and serum cholesterol under control.

While each individual must take responsibility for making changes to ensure good health, it is essential that people receive the information and support necessary to alter and sustain behaviors conducive to cardiovascular health. Statewide partners must recognize the crucial roles they can play in influencing the healthy behaviors of Missourians. Community environments need to encourage physical activity and healthy eating, and discourage smoking in order to allow and support individuals in choosing a heart healthy lifestyle.

As Director of the Missouri Department of Health and Senior Services, I would like to express my appreciation to those responsible for the Plan. I want to thank the Cardiovascular Health Advisory Board for their valuable contribution to the goals and objectives and their review and comments on the Plan. Special thanks go to Missouri Department of Health and Senior Services Bureau of Chronic Disease Control staff who coordinated Advisory Board input and developed drafts of the Plan. I would also like to recognize the financial support provided by the Centers for Disease Control and Prevention toward the development of the Plan and the enhancement of a statewide cardiovascular health program to improve the health of Missouri's citizens.

A handwritten signature of Maureen Dempsey in black ink.

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Executive Summary

As in the United States, cardiovascular disease (CVD) is the leading cause of death in Missouri among all racial and ethnic groups and for both sexes. In the period between 1990 and 1997, heart disease and stroke claimed the lives of 174,640 Missourians. In addition to this staggering loss of lives, in 1997 alone, hospitalization expenditures relating to CVD cost Missouri over one billion dollars.

The largely preventable nature of this disease makes the deaths associated with CVD even more tragic. Behavioral modifications which include becoming regularly physically active, practicing good nutritional habits, quitting smoking, and maintaining a healthy weight substantially reduce one's risk of suffering from CVD. Unfortunately, some people will not get the chance to change their behaviors: about half of all deaths from coronary heart disease are sudden and unexpected. This emphasizes the importance of primary prevention—preventing the onset of CVD.

Despite remarkable declines in overall CVD mortality rates since 1950, certain segments of the population have not benefited equally. Of particular concern are African Americans and persons of low socioeconomic status (SES) who experience considerably higher rates of heart disease and stroke than whites and persons of higher SES. Additionally, women are considered a priority group due to the disproportionate number of African American women who are overweight and in light of a concerning reversal in declining stroke rates for white women.

A variety of methods can be employed to reduce the burden of CVD in Missouri. Increased public awareness of the gravity of CVD and

its prevention through risk factor modification is a critical first step. Approaches that examine and change policies and environmental conditions help make communities more supportive of the behaviors necessary for cardiovascular health.

In order to significantly impact CVD mortality rates and affect CVD risk factors, it is necessary to use both population-based and high-risk approaches. Population-based approaches address health concerns from a comprehensive perspective, while high-risk methods target priority populations with tailored materials, messages, and interventions.

These CVD health priorities and implementation approaches provide the framework for the Missouri Cardiovascular Health State Plan.

"...between 1990 and 1997, heart disease and stroke claimed the lives of 174,640 Missourians."



Progress Toward 1991 State Plan Objectives

In 1991, the Missouri Department of Health and Senior Services' Cardiovascular Health Task Force developed the Missouri Cardiovascular Health Plan. The plan sought to raise awareness of the devastating and life threatening consequences of cardiovascular disease (CVD) and create a framework to plan and implement cardiovascular health promotion activities and policies.

The goals and objectives developed in the 1991 Plan were based largely on year 2000 objectives from "Healthy People 2000: National Health Promotion and Disease Prevention Objectives." They targeted a wide variety of CVD issues including coronary heart disease, stroke, cigarette smoking, environmental tobacco smoke exposure, high blood pressure, high blood cholesterol, diet and nutrition, physical inactivity, overweight/ obesity, community-based programs, policy and legislation, local public health agency practice, physician practice, and surveillance and data collection. The goals and objectives set in the 1991 Plan, with only a few exceptions, are still far from being achieved (Tables 1 and 2).

While progress has been limited

in the last ten years in Missouri, nationwide over the last 50 years, age-adjusted death rates from CVD have declined 60%, representing one of the most significant public health achievements of the 20th century.¹ This improvement can be attributed to a number of trends including a decline in adult smoking rates, decreases in mean blood pressure and cholesterol levels, and advanced medical care and treatment.¹

Though national trends show positive changes, unfortunately CVD remains the primary killer across the U.S. and in Missouri. For Missouri women and the African American population, the progress has been especially disheartening. In the past ten years, women, particularly African Americans, experienced increases in obesity above the national average. In addition, among women of all races/ethnicity, stroke mortality increased during the past four years, reversing a 25-year downward trend (see section on *Priority Populations*).

The rates of individuals screened for high blood pressure and high blood cholesterol have not changed considerably since 1989.

However, those identified with these conditions are increasing their physi-

cal activity levels to control their medical conditions, and those identified with high blood pressure are increasingly controlling their weight to manage their hypertension. Though these are positive trends, rates still fall much below the year 2000 goals.

Over the last decade, improvement has been limited on impacting the major behavioral risk factors for CVD: physical inactivity, poor nutritional habits, and smoking. Despite some positive trends, fewer people are engaging in regular physical activity; an increasing percentage of adults are overweight; and, Missouri smoking prevalence remains above the U.S. rate.

"...nationwide over the last 50 years, age-adjusted death rates from CVD have declined 60%, representing one of the most significant public health achievements of the 20th century."

Table 1
Coronary Heart Disease and Stroke Mortality Rates*

	1990	1998	Yr. 2000 Goal
Coronary Heart Disease	113	98	91
Coronary Heart Disease among African Americans	143	132**	118
Stroke	28	28	18
Stroke among African Americans	43	40**	24

* Mortality rates per 100,000 age-adjusted to the 1940 U.S. population

** Indicates 1997 data

Source: Missouri Department of Health and Senior Services, Information, Management and Epidemiology (CHIME)

Table 2
CVD Risk Factor Comparison

Medical Risk Factors (Proportion of Adults)	1989	1997	Yr. 2000 Goal
Blood Pressure (Screened in Past Year)	89	86	98
Controlling Weight for Blood Pressure	45	71*	60
Exercising to Control Blood Pressure	40	52	95
Blood Cholesterol (Screened in Past Year)	59	68	75
Controlling Weight for Cholesterol	73	71	90
Exercising to Control Cholesterol	40	52	60
Behavioral Risk Factors (Proportion of Adults)	1990	1998	Yr. 2000 Goal
Consume 5+ Servings of Fruits and Vegetables Daily	17	20	25
Overweight (20% Above Ideal Body Weight)	29	35	25
Engage in No Leisure Time Physical Activity (LTPA)	35	28	22
Engage in Regular Physical Activity (PA) 3+ times per wk	39	30	50
Smoking	27	26	14

* Indicates meeting or exceeding goal

Source: Missouri Behavioral Risk Factor Surveillance Survey (BRFSS)

Current Efforts

Efforts to address the goals set in the 1991 State Plan have included programs to increase screening, referral and follow-up for those individuals at risk for high blood pressure and high blood cholesterol levels. The Missouri Department of Health and Senior Services (MDHSS) has supported such screening activities since 1993 in the cities of St. Louis and Kansas City and southeastern Missouri — three areas of the state with a high population of African Americans at increased risk for CVD. As a result of this Cardiovascular Risk Reduction (CVRR) Program, education and screenings, referrals, and follow-up have been implemented through community-based and church-based programs. Additionally, school-based programs were implemented as part of the CVRR program in the same three regions to reach elementary school children with nutrition

education programs.

Recent evaluation of the CVRR Program led to restructuring of program activities. Each of the three areas now has one program focus which concentrates limited resources on fewer outcomes. This approach should facilitate evaluation with hopes of demonstrating success in the areas of worksite wellness (Kansas City focus); community screenings with aggressive follow-up procedures (St. Louis focus); and, school-based physical activity programs (southeastern Missouri focus).

MDHSS has also provided technical assistance and resources to local communities across Missouri regarding CVD and its risk factors.

Only recently has MDHSS had resources to address CVD risk factors on a more comprehensive statewide basis. Based on the high CVD mortality rate in Missouri, the state was eligible for and was awarded a

Centers for Disease Control and Prevention (CDC) grant for a cardiovascular health program. This grant focuses on the CVD risk factors of physical inactivity and poor nutritional habits from a policy and environmental perspective. A population-based approach is employed in combination with high-risk strategies for specific populations.

The CDC grant has allowed the state to build the needed infrastructure for a statewide Cardiovascular Health Program. Necessary staff has been added to focus efforts on the establishment of community-based programs that address physical inactivity and unhealthy eating by changing the policies and environment conditions inhibiting recommended health behaviors.

In order to demonstrate effective implementation of community-based policy and environmental change strategies, funding was allocated to local public health agencies in April, 1999 to allow 16 pilot communities to inventory local policy and environmental needs regarding physical activity and nutrition, determine and prioritize barriers to physical activity and nutrition, and develop plans to change or eliminate one or more of the identified barriers. The communities were chosen based on their capacity to implement the project, measured by the existence of a diverse community coalition or evidence of one being developed; demonstration that cardiovascular health was an established priority in the community; and evidence of a project director at the local public health agency willing to coordinate efforts through the coalition.

In the second year of this project, the original 16 communities will be invited to reapply for further funds pending successful completion of year one activities. (See Appendix A for a summary of project activities). Subsequent years of this project will involve the phasing in of several coun-

ties identified with high rates of CVD. These counties will use materials that have been revised based on feedback from the original 16 communities.

To monitor the long-term effect of this environmental and policy focused strategy, two counties in northwestern Missouri have been identified as control communities for comparison purposes. Further evaluation efforts include implementation of a population-based survey in intervention and control communities to provide additional baseline information on the community's perception of the existing environmental barriers and enabling factors conducive to a heart healthy lifestyle.

Further activities resulting from this grant program include the development of a diverse statewide advisory board for cardiovascular health and the revision of the state plan for cardiovascular health.

The CDC grant program follows a national trend to examine and develop means to address the policy and environmental issues surrounding physical activity and nutrition. State health agencies, both grant funded and non-funded, are expanding their focus be-

yond a strict health education and health promotion approach to CVD. Many state health agencies are partnering with other public and private agencies in order to provide the supportive environments necessary for truly healthy communities where people can safely walk, bike, garden and play in local neighborhoods, and have available to them affordable heart healthy foods.

Partnerships

We continue to strengthen and further our partnerships in order to coordinate efforts and avoid duplication of activities. Partnerships have been pursued with other state agencies (e.g., Departments of Natural Resources, Transportation, Agriculture, and Local Public Health Agencies); medical care providers (e.g., physician associations, managed care organizations, and hospital systems); and not-for-profit organizations working to fight CVD and other chronic diseases (e.g., American Heart Association, American Diabetes Association, etc.) in order to address the challenge of creating healthy Missouri communities.

CVD in the US and Missouri

CVD pertains to conditions affecting the heart and blood vessels, including coronary heart disease, atherosclerosis, stroke, and high blood pressure. Over 58 million Americans live with one or more types of CVD and almost one million lives were lost to CVD in 1996. In the United States, total cardiovascular diseases are the most common cause of death (Figure 1) and have been for every year since 1900 except one (1918).²

Costs related to CVD morbidity and mortality were estimated to reach a staggering \$287 billion in 1999.¹ This amount reflects health expenditures (e.g., cost of physicians, hospital and nursing home services, cost of medications, home health costs, etc.) and lost productivity (indirect

costs).

As in the U.S., CVD is also the most common cause of death in Missouri among all racial and ethnic groups and for both sexes.

Missouri ranks among states with the highest CVD rates (Figure 2). In the period between 1990 and 1997, heart disease and stroke claimed the lives of 174,640 Missourians, which is more than ten times the number of deaths caused by some of the world's most devastating earthquakes. In 1997 alone, hospitalization expenditures relating to CVD cost Missouri over one billion dollars.³

In 1997, CVD accounted for 42% (22,624) of deaths in Missouri, which is more than the next eight leading causes of death combined. The

majority of CVD is the result of ischemic heart disease. (Figure 3)

Comparison of CVD mortality across the state discloses large differences between counties (Figure 4). The overall rate for Missouri is 195.9 per 100,000 (age-adjusted to the 1940 US standard population). However, the range extends from a low of 148.5 in Howard County to 327.5 in Pemiscot County.

"Costs related to CVD morbidity and mortality were estimated to reach a staggering \$287 billion in 1999."

Figure 1: Causes of Death, United States, 1995*

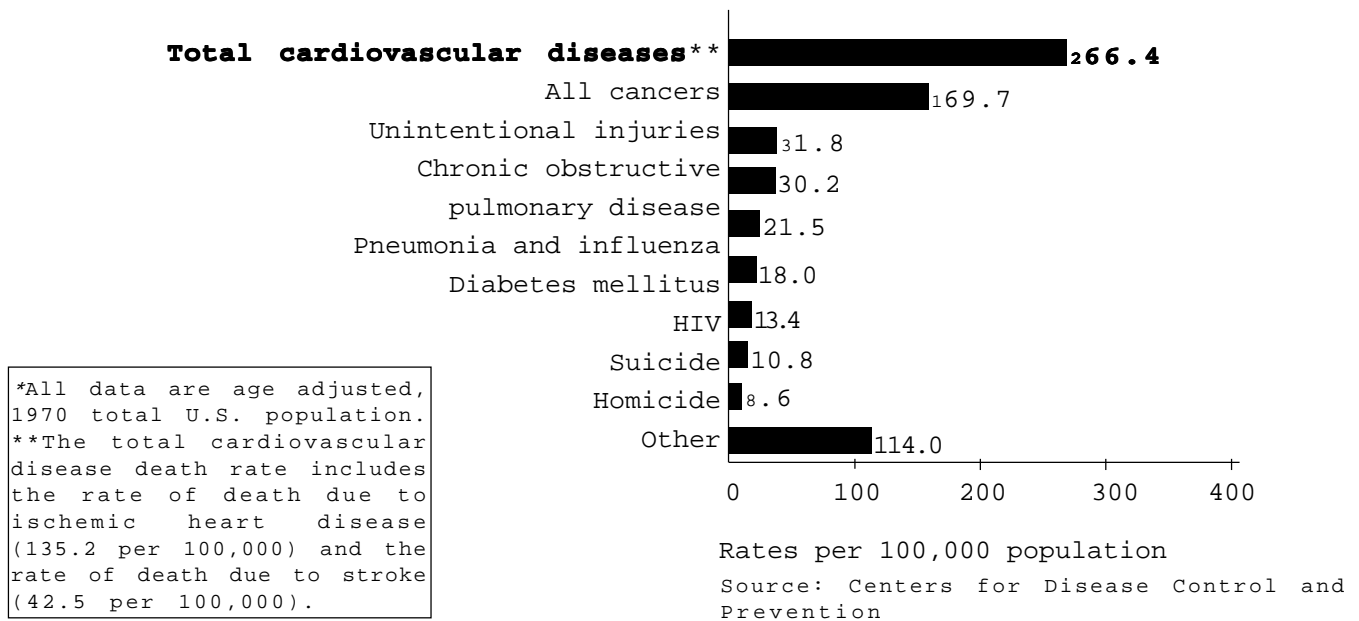


Figure 2: Rates of Death Due to Total Cardiovascular Disease,* 1995

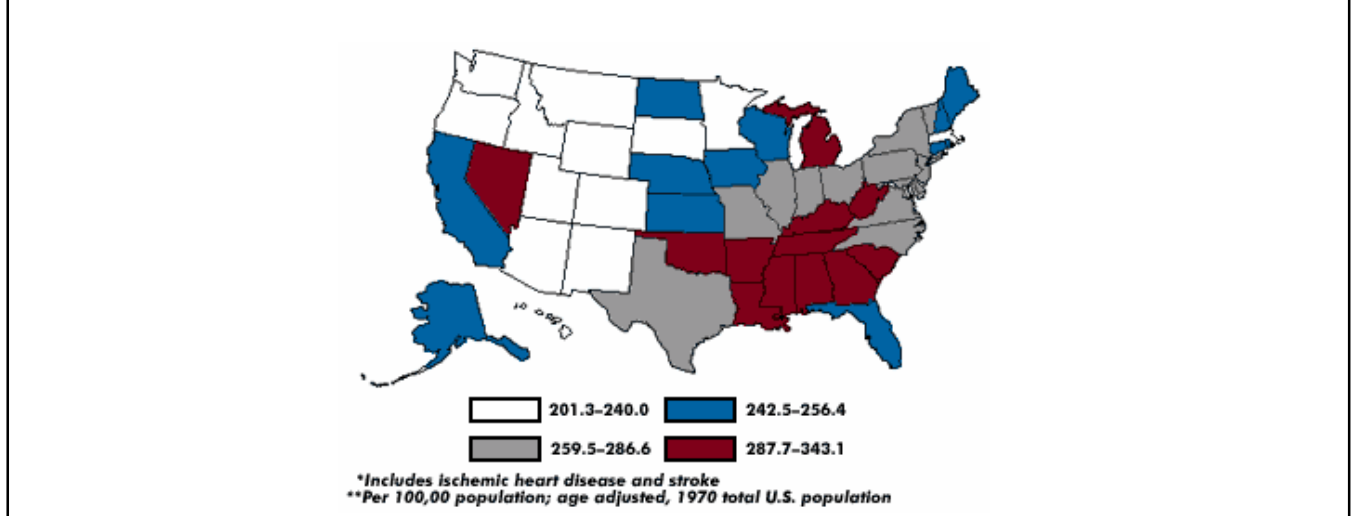
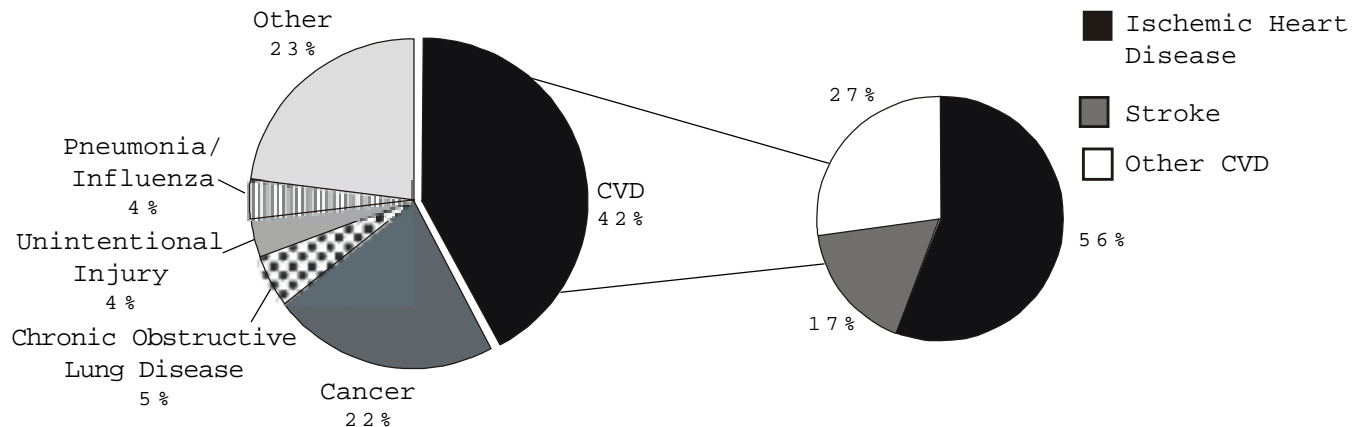
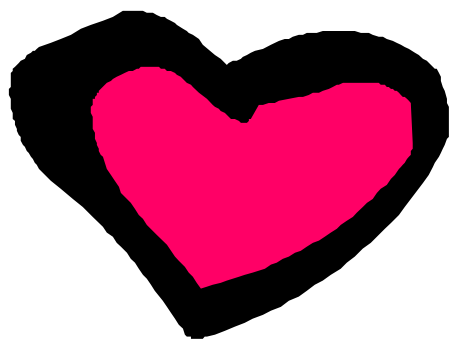
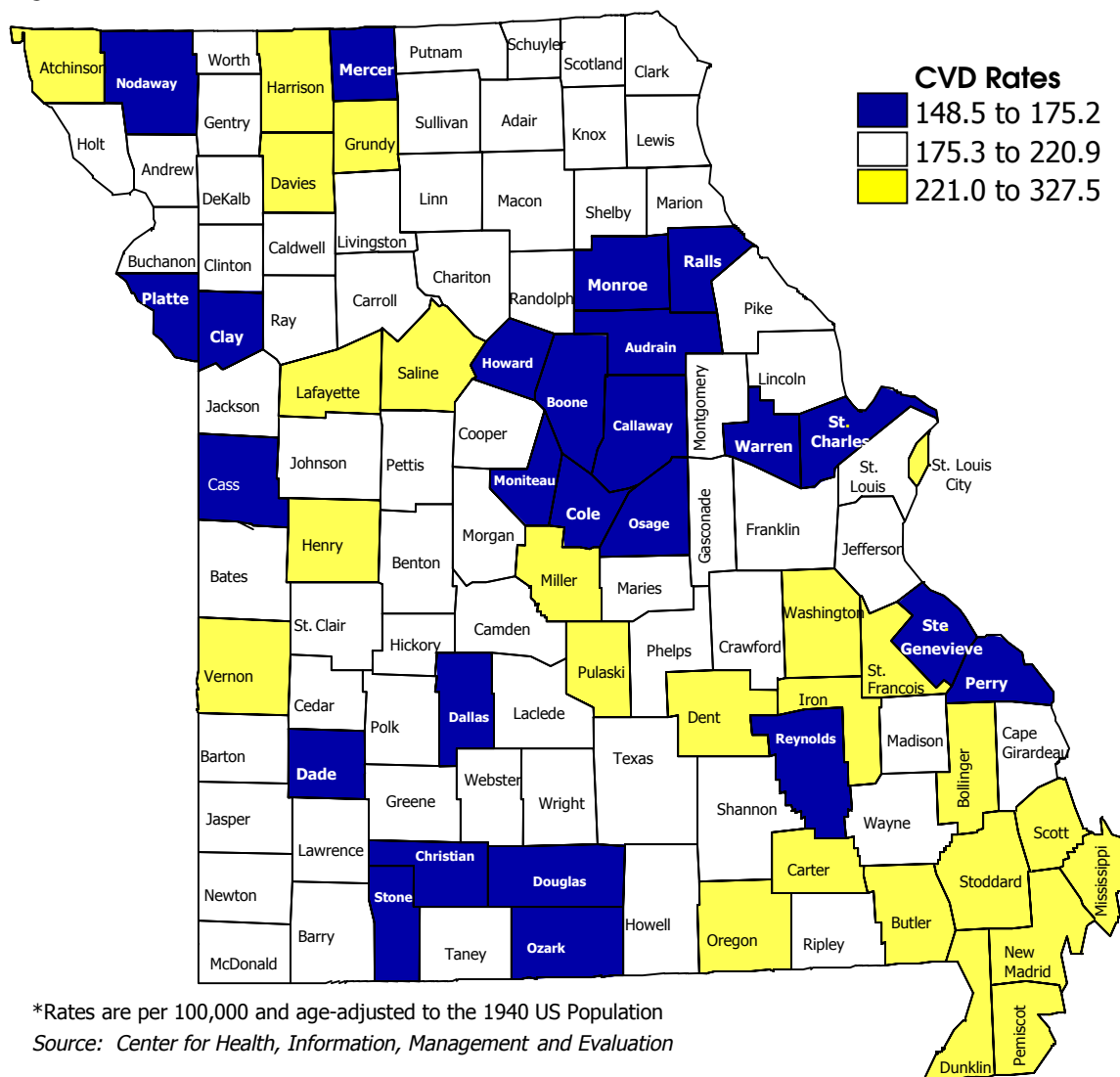


Figure 3: Leading Causes of Death in Missouri, 1997



Source: Missouri Department of Health and Senior Services, Center for Health, Information, Management and Epidemiology (CHIME)

Figure 4: CVD Mortality Rates by County, 1990-1996*



CVD Risk Factors

Behaviors, conditions or characteristics that increase the risk of developing CVD are called risk factors. CVD risk factors include:

Behaviors

- Physical inactivity
- Poor nutritional habits
- Smoking

Conditions

- High blood pressure
- High blood cholesterol
- Diabetes
- Obesity
- Uncontrolled stress

Non-modifiable Characteristics

- Age
- Family history
- Gender
- Race

The behavioral risk factors are the consequence of lifestyle choices. The conditional risk factors are the result of both our lifestyle choices and characteristics, such as those listed under the non-modifiable risk factors. While nothing can be done about our age, family history, gender or race, the other risk factors involve personal behaviors or conditions that can be changed. It has been suggested that CVD mortality could be reduced by 60% through continued reduction of established personal risks and habits such as cigarette smoking, high blood pressure, high blood cholesterol, unhealthy eating, and physical inactivity.⁴

The conditional risk factors of high blood pressure, high blood cholesterol, diabetes and obesity can be improved by concentrating on physical inactivity, poor diet, and tobacco use—the three behavioral risk factors which account for at least one-third of all deaths (Figure 5).

Physical inactivity and poor nutritional habits are risk behaviors that have a critical impact on health

and especially cardiovascular health. Together, they account for 300,000 preventable deaths each year and contribute to high rates of obesity. Only tobacco use causes more preventable deaths in the United States and in Missouri.

Based on the above facts and national efforts by the CDC, the Missouri Cardiovascular Health Program will concentrate its primary prevention program on physical inactivity and poor nutritional habits over the next ten years. We will partner with the Tobacco Use Prevention Program (formerly ASSIST) as they continue to intervene to impact the rates of smoking and other tobacco use. Finally, through our partnerships with health care organizations and the American Heart Association, we will strengthen our community-wide efforts to improve secondary (e.g., cholesterol and blood pressure screening) and tertiary prevention (e.g., reduction of preventable death and complications among CVD patients).

Physical Inactivity

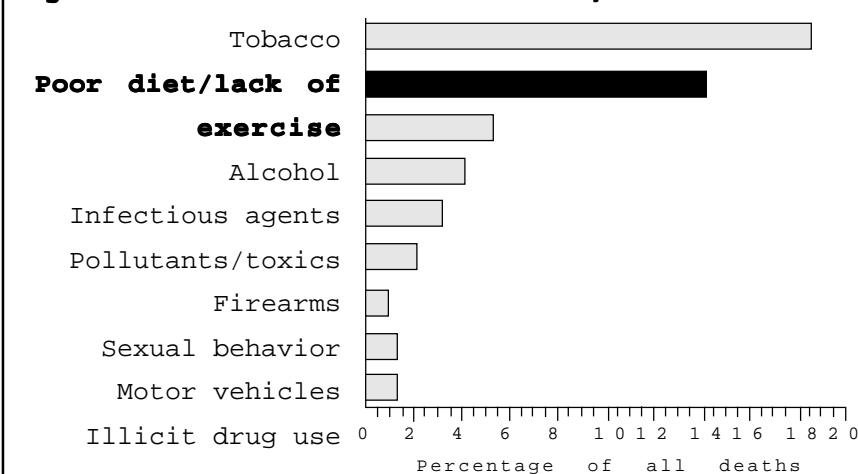
The increasing trend of leading a sedentary life can be a deadly one. Studies confirm that low levels of

physical activity increase one's risk of dying from CVD.⁵ Significant health benefits can be obtained by including a moderate amount of physical activity (e.g., 30 minutes of brisk walking) on most, if not all, days of the week. Yet, almost 28% of Missouri's adults do not get any leisure-time physical activity, and another 30% do not get enough physical activity to achieve health benefits (Figure 6).⁶

Poor Nutrition

Strong and consistent epidemiological studies link diets high in saturated fat and cholesterol with the development of CVD.⁷ Diet affects the status of all the conditional risk factors mentioned confirming its role as a cornerstone in preventing CVD. Consuming at least five servings of fruits and vegetables per day, and eating a diet low in saturated fat contribute to cardiovascular health. Despite improvements, there remains a large gap between the recommended dietary patterns and what Missourians eat. Currently, only 20% of Missouri's adults eat at least five servings of fruits and vegetables per day.⁶

Figure 5: Actual Causes of Death, United States



Source: McGinnis JM, Foege WH. Actual causes of death in the United States. JAMA 1993; 270:2207-12 (1990 data). Note: The percentages used in the figure are composite approximations derived from published scientific studies that attributed death to these causes.

Overweight/Obesity*

Being overweight increases one's likelihood of dying from CVD even without the presence of other risk factors. Recent studies demonstrate increasing risks of nonfatal myocardial infarction and coronary heart disease death with increasing Body Mass Index or BMI (BMI is equal to weight in kilograms divided by the square of height in meters) with the lowest risk among those with BMIs of 22 kg/m² or less.⁸ Unfortunately, both nationally and in Missouri, rates of overweight and obesity have been growing. Currently, 34.6% of Missouri adults are overweight (Figure 6).⁶ It's important to note that significant health benefits can be achieved by losing only 10% of one's body weight.

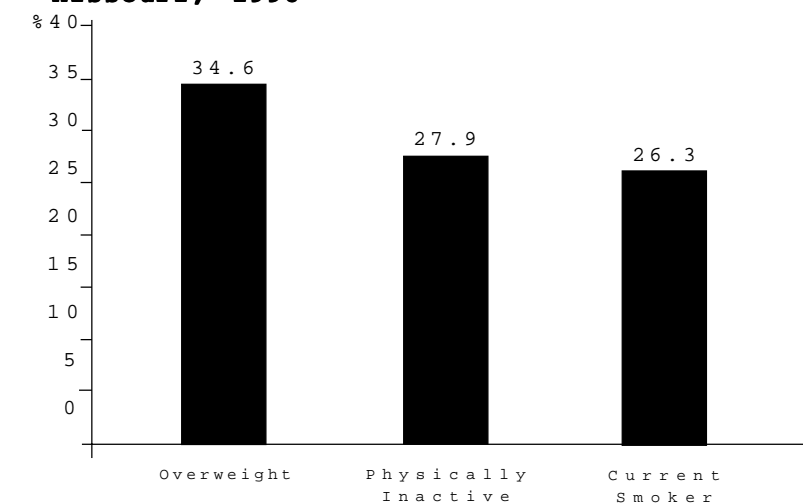
**Overweight was classified for adults as a BMI >27.3 kg/m² for women and >27.8 kg/m² for men for these estimations and percentages. For consistency, these BMIs are used throughout this plan, however new clinical guidelines were adopted in 1998 that classify overweight for women and men as a BMI of 25 kg/m² to 29.9 kg/m² and obesity as a BMI of >30 kg/m², which is about 30 lbs overweight.⁸*

Smoking

The risk of dying from heart disease among middle-aged men and women is tripled among smokers.⁹ According to CDC, nearly one-fifth of all deaths from CVD are attributable to smoking—that's approximately 4,525 deaths in Missouri each year. Over one-quarter (26.3%) of adults in Missouri are smokers, ranking Missouri among

the states with the highest smoking rates (Figure 6).⁶ Luckily, it is never too late to stop smoking. While the risk for CVD increases with the number of years a person smokes, individuals who stop smoking eventually reduce their risk for CVD to a level approaching that of nonsmokers.¹⁰ In fact, smokers who quit will reduce their risk of CVD by half after only one year.¹¹

Figure 6: Selected CVD Risk Factor Prevalence - Missouri, 1998

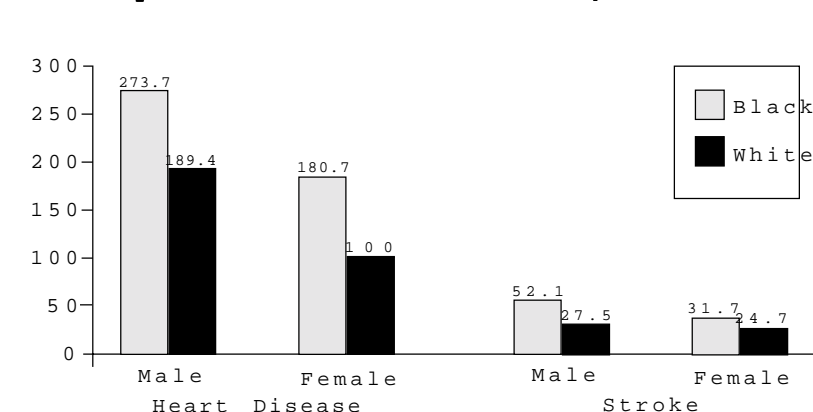


Source: Behavioral Risk Factor Surveillance Survey

Priority Populations

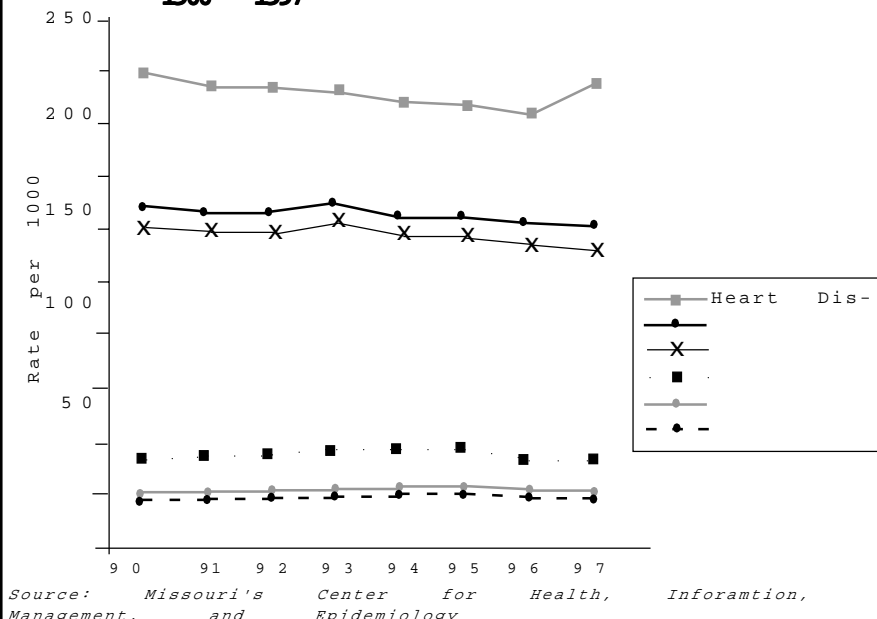
Though most of our current and future efforts have a population-based approach, a high risk intervention is necessary to bridge a few gaps in CVD occurrence in Missouri. While CVD claims the most lives across both sexes and all races, there are discrepancies. Certain segments of the population experience a greater burden of the disease than others. African Americans, persons of lower socioeconomic status (SES), and women are either affected disproportionately by CVD or have experienced negative trends in disease and risk factors likely to affect the current pattern of disease occurrence.

Figure 7: Heart Disease and Stroke Mortality Rates by Sex and Race - Missouri, 1997



Source: Missouri's Center for Health, Information, Management and Epidemiology

Figure 8: Heart Disease and Stroke Mortality Rates in Missouri 1990 - 1997



Racial Disparity

Despite overall declines in CVD rates in past decades,¹ striking racial disparities exist, specifically between African Americans and whites in Missouri. Census data from 1990 indicates that African Americans constitute 11% of the population in Missouri and comprise almost 82% of the state's minority population.¹²

Figure 7 shows that African American males and females experience excessive rates of both heart disease and stroke. Figure 8 demonstrates that considerably higher rates among African Americans is not a new phenomenon in Missouri.

The disparity between African Americans and whites in Missouri extends to two of the three main modifiable risk factors associated with CVD (Figure 9). It is estimated that 31% of excess mortality in African Americans can be related to the prevalence of modifiable CVD risk factors.¹³

Historically, African Americans have had higher rates of smoking than the general U.S. population, however in recent years rates have been similar.¹⁴ Despite this, certain facts still make African Americans a priority group in regards to smoking: 1) African Americans smoke fewer cigarettes per day than whites, but they smoke brands with

higher nicotine levels;¹⁵ 2) African American men stand the greatest risk of dying from lung cancer, with a death rate 50 percent higher than white men;¹⁴ and 3) African American communities have 2.6 times as many billboards advertising cigarettes as white communities.¹⁴

Between 1990 and 1996, surveys were conducted in St. Louis, Kansas City, and the Bootheel to explore the prevalence of modifiable CVD risk factors among Missouri's African American population. The study revealed higher risk factor prevalence rates and less improvement in the status of physical inactivity, obesity, and

smoking for African Americans as compared to whites/others during the study period. In fact, between 1990 and 1996, African American males in the study region did not experience any statistically significant reductions in these risk factor prevalence rates.¹⁶

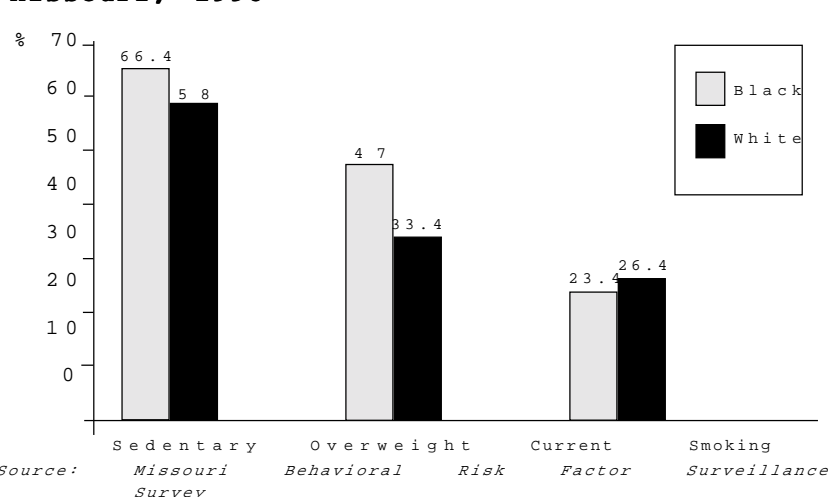
Poverty, unemployment, poor general health, inadequate access to proper health care, lack of health insurance, educational disadvantages, and social barriers (e.g., racism, cultural insensitivity) are burdens all too common in the African American population and may affect their CVD risk profile.¹⁷

Women

Obesity among African American females presents a particular concern (Figure 10). Overall, the rate of obesity among adult Missourians is increasing, with the predicted year 2000 rate of 35% already being exceeded.¹⁸ However, even more alarming is that in 1997 about half of African American women (50.8%) in Missouri were overweight and 100% are expected to be overweight by 2010 if current trends continue.¹⁹ Between 1990 and 1996, African American females in the three study areas cited above experienced a 30.1% increase in obesity prevalence, compared to a 21.5% increase for all groups in the study areas during the same time period.¹⁶

Despite statistically significant decreases in stroke rates for African

Figure 9: Selected CVD Risk Factors by Race - Missouri, 1998



American and white women between 1980 and 1990, current trends demonstrate a reversal of this positive change, especially for white women (Figure 11).²⁰ If current trends continue, stroke rates for white women will actually surpass that of white men, while rates for African American women will begin to approach that of African American men—the population with the highest stroke rate.

Socioeconomic Disparity

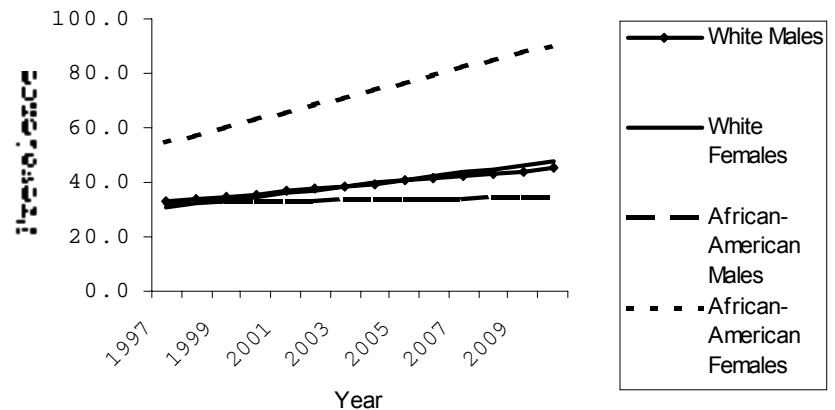
Socioeconomic status is usually defined by the level of one or more of the following variables: income, education, and occupation. These variables are highly correlated and interrelated.²¹ Approximately 15% of the U.S. population live in poverty as defined by family income.²¹ However, poverty rates vary significantly by race. National data show that African Americans are more than three times as likely as whites to live in poverty.²¹

An inverse relationship between socioeconomic status (SES) and CVD mortality rates places a number of Missourians at an increased risk of adverse cardiovascular health outcomes.

Approximately 13% of Missourians live below the poverty level (451,291)³ and 26.1% (858,368) have less than a high school education.²²

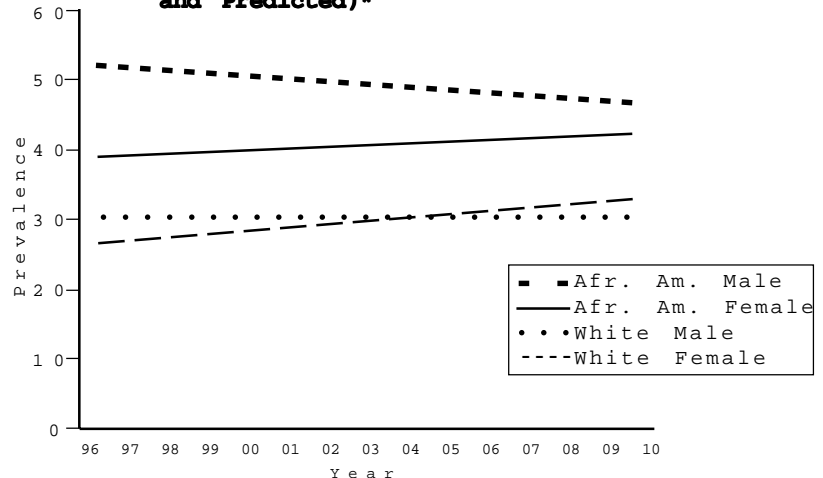
There also exists an association between low SES and prevalence of CVD risk factors. A study on CVD risk factor trends in Missouri between 1986 and 1995 revealed that those with less than a high school education had higher rates of physical inactivity, smoking, and obesity.¹⁸ Missouri BRFSS 1998 data are consistent with these findings (Figure 12), demonstrating a discrepancy in risk factor prevalence particularly for physical inactivity and smoking when comparing those with less than a high school education to those with a high school education or higher. Education is considered a proxy, or representative, measure for SES that is a strong predictor of good health.²³

Figure 10: Age-Adjusted Weighted Prevalence (Observed and Predicted) of Obesity*



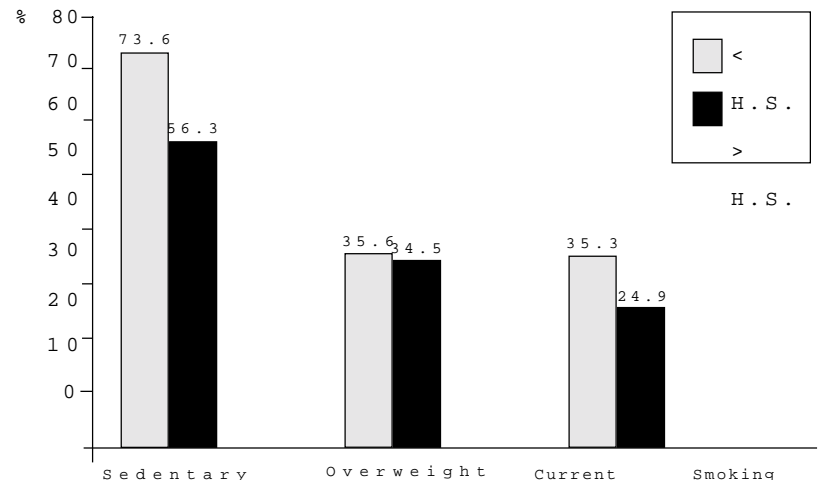
Source: MDHSS, Chronic Disease Data for Decision Making and Planning-Volume II
 *Age standardized to the 1970 US population, and expressed as a percentage
 Predictions are based on BRFSS data from 1987-1996

Figure 11: Stroke Age-Adjusted Mortality Rates (Observed and Predicted)*



Source: MDHSS, Chronic Disease Data for Decision Making and Planning Volume I
 * Age standardized to the 1940 US population, and expressed per 100,000 individuals
 Predictions are based on mortality data from 1980 - 1996

Figure 12: Selected CVD Risk Factors by Educational Level - Missouri, 1998



Source: Missouri Behavioral Risk Factor Surveillance Survey

Community-Based Health Programs

An Environmental and Policy Approach

The goal of long-term behavior change to combat chronic disease is one that has traditionally focused on educating the individual regarding the adoption of prevention methods. However, studies have shown that any success attained through behaviorally focused interventions targeting the individual generally dissipate with the passage of time.²⁴ This fact reinforces that while altering CVD risk factors begins at the individual or family level, maintaining change depends upon community support and reinforcement.²⁵

It is therefore unreasonable to presume that substantial proportions of a population will make individual behavior changes that are discouraged by the environment and prevailing social norms. As a result, any effort to effectively impact long-term change must reinforce interventions that deal with personal behaviors with those that involve efforts to affect the environment and health-related policies.^{24,26}

Environmental strategies can be defined as interventions or measures that alter or otherwise control the legal, social, physical, and economic environment. In this regard, environ-

mental strategies focus on disease prevention by influencing change at the level of resource availability, accessibility, or by attempting to change social norms. Examples include:

- opening school gymnasiums in inner city neighborhoods before or after school to provide access to a secure environment for physical activity;
- improving street lighting to enable community members to take a walk in the evening;
- restricting youth access to tobacco products by removal of cigarettes from vending machines;
- increasing the availability of healthy foods in company vending machines.²⁴

Policies may entail either formal legislation or regulation (i.e., clean indoor air laws) or they can occur more informally at an organizational level (i.e., management allowing flex-time for physical activity).²⁴ Avenues to promote policy change include community organization, coalition and network-building, social movements, mass media campaigns, professional organiza-

tions, and legislative efforts.²⁷

Examples of policy changes include:

- extending hours at recreational facilities;
- increasing taxes on tobacco products;
- creating nutrition labeling requirements for restaurants.

Environmental and policy changes often overlap. For example, the environmental change of improving paths in city parks might involve legislative or regulatory changes to local zoning laws or a re-appropriation of state or local funds for park improvements.

To be most effective, however, policy and environmental changes need to involve many groups in forming coalitions at different levels of society to plan, implement, and evaluate interventions. State and local health departments are ideally suited to actively develop such networks through public and private partnerships. Moreover, it's only through interventions at multiple levels (e.g., schools, communities, and worksites) that significant reductions in cardiovascular disease will be achieved.^{26,28}

Population-Based and High-Risk Approaches

As evident from its name, a population-based approach addresses health concerns from a broad perspective in an attempt to impact overall health outcomes. The population-based approach aims to shift the average or median risk of developing disease, or the median prevalence of a risk factor in the whole population to a lower level.

The high-risk approach identifies sub-populations, through socio-demographics, that are at a higher than average risk of developing or

suffering the consequences of a specific disease. This approach strives to reduce the identified population's risk or burden to a lower level, or to a level similar to that of the rest of the overall population.

Employing only a high-risk approach means that many individuals in the overall population will still have a higher than average risk of developing or suffering the consequences of a specific disease,

despite a reduction of this risk in the target high-risk population. Utilizing only the population-based approach might succeed in improving the overall population risk distribution, however, the relative gain for the high-risk target population will be minimal. The combination of high-risk with a population-based approach will have the greatest benefit for all, while bridging the gap between sub-populations.

Evaluation

Evaluation and monitoring of State Plan activities will allow the Cardiovascular Health Program and the Cardiovascular Health Advisory Board to implement necessary program modifications, assess program impact, and determine the costs and benefits of Plan activities. Evaluation of the Plan will be implemented jointly by the Division of Chronic Disease Prevention and Health Promotion's medical epidemiologist, CVH program personnel, and the Office of Surveillance, Research, and Evaluation (OSRE).

Evaluation will consist of process, impact and outcome evaluation. The process evaluation will focus on the immediate outputs; impact evaluation will monitor intermediate (2-5 year) outcomes in the communities – mainly in relation to policy and environmental changes; and outcome evaluation will consist of determining long-term progress regarding overall health indicators and behaviors.

Major data sources that will be monitored include: Behavioral Risk Factor Surveillance Survey (beginning in 1999, data will be analyzed on a regional basis); hospital abstraction system data (hospital discharge data) from the Center for Health, Information, Management, and Evaluation; incidence and mortality data from OSRE reports such as the "Chronic Disease Data for Decision Making and Planning" report series which will be updated every two years; data from special surveys on policy and environmental perceptions, obesity, and minority-targeted surveys.

Process Evaluation

The process evaluation consists of two complementary components. The first component monitors changes or documents the accom-

plishment of specific program strategies and activities. It compares the observed outputs with the projected outputs as defined in Plan objectives. Evaluation measures for this component are detailed, as appropriate, in the following section as relates to the specific objectives outlined.

The second component relies on the reporting of quantitative program implementation outputs as they relate to day-to-day activities, use of resources, and disbursement of funds. Process output indicators include:

- # of policy/environmental contracts with counties;
- # of CVD-related coalition meetings in target counties;
- amount of money distributed for policy/environmental changes to counties;
- # of advisory board members and organizations represented.

Impact Evaluation

Impact evaluation will monitor changes in the type and number of intermediate outcomes such as community-wide policy and environmental changes. This evaluation will use baseline and biannually updated data generated from both local policy/environmental inventories and a more comprehensive assessment of select policy and environmental indicators.

It will also be possible to use cross-sectional data from a "Special Survey" implemented in the summer of 1999 (with re-implementation planned every three years) that measures individual perceptions of policy and environmental issues in St. Louis, Kansas City, the Bootheel, and select central Missouri counties, as well as a control county in the northwest.

Some policy and environmental

changes are expected to occur after the third year of program implementation and likely most will take about five years. Due to the lack of knowledge about the duration required for policy/environmental interventions to result in changes, there is a need for monitoring on an annual basis.

Indicators that will be tracked include community, school, and worksite policies and environmental changes relating to both physical activity and nutrition. The specific indicators are integrated into the evaluation section that follows the policy and environmental objectives listed in the next section, including for example:

- ratio of pedestrian-friendly miles/total miles assessed;
- # miles of walking trails per capita or per land area;
- percent of sit-down restaurants in a community offering heart-healthy menu choices (e.g., low-fat foods and fruits/vegetables);
- # schools requiring physical education three or more times per week for at least 30 minutes/period;
- # worksites in a community offering heart-healthy items (e.g., fruit juices, low-fat snacks) in vending machines.

Outcome Evaluation

Outcome or final impact evaluation refers to the assessment of overall program or intervention effects on the risk of developing a specific disease and the risk of dying from the disease. It has a longitudinal perspective with a time frame determined by the induction time for disease occurrence or complication and death from the disease once disease is detected. In the special case of CVD, this time

frame is between 10 and 20 years. For disease mortality, evidence-based reviews have shown disease mortality reduction within five years. Therefore, for CVD disease risk reduction, the time frame is 5-10 years.

Indicators of progress will include measurement of the ob-

served versus the projected (as outlined in the subsequent *objectives* section) crude mortality rates and crude weighted prevalence rates of CVD risk factors. Age-adjusted rates will be monitored to assess a change in indicators over time and for comparison between regions.

Goals and Objectives

The objectives that follow are meant to guide Missouri's efforts to reduce CVD. The focus of the objectives is driven by the policy and environmental approach discussed in the preceding section with interventions largely limited to the areas of physical activity and nutrition for reasons explored earlier.

Missouri's Tobacco Use Prevention Program maintains a set of objectives not included in the following section, but efforts in meeting those objectives will certainly contribute to and be accounted for when measuring progress towards reduction in CVD. However, partnership with the Tobacco Use Prevention Program and additional efforts to garner support for tobacco use cessation are objectives of this Plan, as laid out in this section.

Some of the following objectives refer to an inventory tool (Appendix B) that allows intervention communities (such as the initial 16 LPHAs) to assess the local policies and environmental factors that support or discourage physical activity and good nutritional habits. Through use of this tool, and additional processes that guide

communities toward development of interventions to change identified barriers, neighborhoods can address concerns of local importance and tailor interventions to suit the needs of community members.

The results obtained from both process and longer-term evaluation of both the initial intervention counties and those currently being phased in, will help reshape the intervention for eventual statewide dissemination.

It should be noted that it will take the collaborative efforts of many statewide partners to ensure success in meeting these objectives and therefore affect the rates of CVD and its associated risk factors in Missouri.



Goal

Missouri will significantly reduce premature death and disability associated with cardiovascular disease by the year 2010.

I. Main Disease Outcome Objectives for the Year 2010

Baseline: Chronic Disease Data for Decision Making and Planning-Volume I: Incidence and Mortality Trends and Projections, 1996 observed rates.

Crude rates are the actual rates for disease incidence and mortality. Since crude rates accurately describe the burden of disease, they should be used for planning purposes and have been used in the following objectives. However, it is important to note that when comparing the rate of disease of one population with another (such as whites vs. African Americans), or the same population over time, age-adjusted rates should be used as the age structure of the populations may differ from one another making crude rates not comparable.

1. Deaths from CVD* will be reduced from 432.9 to 372.0.**
 - 1a. Deaths from CVD among African Americans will be reduced from 339.2 to 297.1.
*CVD mortality rates are calculated using combined mortality of ischemic heart disease and stroke.
**All mortality rates are age standardized to the 1940 US population and expressed per 100,000 individuals.
2. Deaths from ischemic heart disease will be reduced from 235.9 to 192.5.
 - 2a. Deaths from heart disease among African Americans will be reduced from 167.8 to 146.8.
3. Deaths from stroke will be maintained at 72.
 - 3a. Deaths from stroke among African Americans will be maintained at 55.2.
 - 3b. Deaths from stroke among women will be maintained at 87.9.

Rationale: Target rates are based on MDHSS's *Chronic Disease Data for Decision Making and Planning-Volume I: Incidence and Mortality Trends and Projections* which indicates the potential for significant declines in total CVD and heart disease based on the declining long-term trends. Least squares regression of logged mortality rates for stroke reveals an increasing trend in the rate of stroke deaths. Therefore, stemming this increase is an acceptable objective.

Evaluation: Mortality data from the CHIME will be continuously monitored in addition to future Chronic Disease Data for Decision Making and Planning reports.

II. Main Risk Factor Outcome Objectives for the Year 2010

(Baseline data: Missouri BRFSS 1998, except where noted)

Physical Inactivity

1. The proportion of adults who engage in no leisure-time* physical activity will be maintained or reduced from 27.9%.
 - 1a. The proportion of African American adults who engage in no leisure-time* physical activity will be maintained or reduced from 32.7%.
*If a respondent answers "no" to the following question, they are considered to get no leisure-time physical activity (i.e., they are physically inactive): During the past month, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?
2. The proportion of adults who engage in regular and sustained physical activity (5x/wk for 30+ min/session, regardless of intensity) will be maintained or increased from 19.1%.
 - 2a. The proportion of African American adults who engage in regular and sustained physical activity (5x/wk for 30+ min/session, regardless of intensity) will be maintained or increased from 15.1%.

Nutrition – Unhealthy Eating

3. The proportion of adults whose average daily intake of fruits and vegetables is five or more servings will increase from 20.0% to 22.0%.

- 3a. The proportion of African American adults whose average daily intake of fruits and vegetables is five or more servings will increase from 17.7% to 20.0%.

4. Decrease the median adult fat intake score by 10% from baseline.

(Baseline being obtained through MDOH's 1999 Obesity Reduction Survey.)

Sub-Objective: By 2005, increase the percentage of dairy sales devoted to low-fat dairy products (e.g., 1% or less milk, low-fat yogurt, low-fat cheese) at major Missouri grocery stores by 2% from baseline.

(Baseline: Partner with Missouri Grocer's Association to identify grocery stores for sales tracking.)

Sub-Objective: By 2005, increase intake of 1% or less milk by 5% from baseline.

(Baseline: 1999 Obesity Reduction Survey)

Overweight/Obesity

5. Prevent an increase in the prevalence of overweight among adults. (Baseline: 34.6%)

- 5a. Prevent an increase in the prevalence of overweight among African American women.

(Baseline: 50.8%, Chronic Disease Data for Decision Making and Planning-Volume II: Risk Factors, Prevalence, Trends and Projections, 1997 observed rate)

Smoking

6. Decrease from 26.3% to 25.0% the prevalence of adults in Missouri who are current smokers.

- 6a. Prevent an increase in the prevalence of African American male smokers.

(Baseline: 46.3%, Chronic Disease Data for Decision Making and Planning-Volume II: Risk Factors, Prevalence, Trends and Projections, 1997 observed rate)

High Blood Cholesterol

7. The proportion of adults who have had their blood cholesterol checked within the past five years will increase from 71.2% to 82.1%.

(Baseline: Chronic Disease Data for Decision Making and Planning-Volume II: Risk Factors, Prevalence, Trends and Projections, 1997 observed rate)

High Blood Pressure

8. Prevent an increase in the prevalence of hypertension among adults.

(Baseline: 27.4%, Chronic Disease Data for Decision Making and Planning-Volume II: Risk Factors, Prevalence, Trends and Projections, 1997 observed rate)

Rationale: The above targets are based on current trends which indicate an increasing number of Missourians becoming physically inactive, overweight, and hypertensive. Though overall smoking prevalence rates do not appear to be increasing, rates for African American males seem to be rising.¹⁹ Projections indicate an increasing number of Missourians being screened for high blood cholesterol.¹⁹

The first nutrition sub-objective was incorporated as certain dairy products (e.g., whole milk, cheese) are rich in saturated fat and a significant contributor of saturated fat to the American adult's diet, therefore representing a good point of intervention. Milk intake will be used as a proxy measure despite overall efforts being focused on all dairy products as the Obesity Reduction Survey will be tracking this particular indicator.

Evaluation: Monitor data from Missouri’s BRFSS physical activity, fruit and vegetable, hypertension and cholesterol modules. Review data from MDHSS’s Obesity Reduction Survey implemented in 1999, with anticipated re-implementation every two to three years. Partner with the Missouri Grocer’s Association to review dairy sales data.

III. Policy/Environmental Impact Objectives - Community

Physical Activity and Nutrition

1. By 2005, 25% of Missouri counties will make a policy or environmental change that improves access to pedestrian/community-friendly opportunities* for physical activity in the county.
 - Emphasis will be placed on access to pedestrian/community-friendly indoor/outdoor areas for walking and public physical activity facilities⁺.
- 1a. By 2005, 25% of Missouri counties with at least 10% African Americans, five Kansas City neighborhoods, and five St. Louis neighborhoods will make a policy or environmental change that improves pedestrian/community-friendly opportunities* for physical activity in the county.
 - Emphasis same as above.

*Pedestrian/community friendly environments or facilities are: safe (appropriate traffic signals, lighting, signage); accessible and convenient (adequate number of trails, courts, indoor areas, etc., morning/evening hours available); have adequate infrastructure maintenance (cleaned and repaired sidewalks, roads, facilities, path maintenance programs); and are aesthetically pleasing with appropriate support amenities (shrubs or tree-lined areas, water fountains, no trash or graffiti, etc.).

⁺Public facilities can include trails, tennis courts, public pools, sidewalks, school gyms, etc.

Strategies

- Conduct baseline physical activity policy and environmental assessments by county and in targeted neighborhoods. (1/1a)
- Work toward securing additional funding (General Revenue and Federal) to further address CVH from a policy and environmental perspective. (1/1a)
- Partner with communities and other state and federal agencies (e.g., DOT, DNR, etc.) to conduct policy and environmental inventory and determine and address barriers regarding indoor/outdoor walking areas and public physical activity facilities. (1/1a)
- Facilitate partnerships between communities and local/state physical activity organizations and resources. (1/1a)
- Partner with the Office of Minority Health and the Center on Minority Health and Aging (Lincoln University) to form or strengthen minority community groups with an interest in health and wellness. (1a)
- Provide data on the status of minority health issues in Missouri to community groups and partners to educate and support the need for policy and environmental changes to promote physical activity. (1a)

Rationale: It is unreasonable to expect the population to be physically active without a supportive environment. Strategies will be focused on improving access to pedestrian/community-friendly indoor and outdoor areas for walking and public physical activity facilities due to the fact that a) one of the most common and convenient activities that can be performed by individuals just beginning a physical activity routine is walking, which would be enhanced by reducing environmental barriers that inhibit or discourage walking in the community; and, b) those who are already more active may simply need access to more and/or more acceptable opportunities for physical activity, which would be supplied by establishing or improving public facilities. Neighborhoods within Kansas City and St. Louis were chosen as a more specific means of reaching the large number of African Americans in these two cities.

Evaluation: Track the number of counties/neighborhoods completing the physical activity policy and environmental inventory process. Review data from a “Special Survey” which measures individual perceptions of community policy and environmental issues in Kansas City, St. Louis, the Bootheel, some central Missouri counties, and a control area in the northwest (baseline obtained in 1999 with re-implementation planned once every three years).

Obtain baseline data and continually monitor the following indicators to assess the existence and condition of public physical activity facilities:

- ratio of pedestrian-friendly miles/total miles assessed; number of miles of walking trails per capita or per land area; and percent malls/schools with indoor walking programs
- ratio of community-friendly walking facilities (parks, fields, gyms) per capita or per total community area; number of facilities per capita that are open to community members, are affordable and have convenient hours of operation.

2. By 2005, 25% of Missouri counties will make a policy or environmental change that enhances access to heart healthy food.

2a. By 2005, 25% of Missouri counties with at least 10% African Americans, five Kansas City neighborhoods, and five St. Louis neighborhoods will make a policy or environmental change that enhances access to heart healthy food.

Strategies

- Conduct baseline nutrition policy and environmental assessments by county and in targeted neighborhoods. (2/2a)
- Partner with communities and other state and federal agencies (e.g., Department of Agriculture) to conduct policy and environmental inventory and determine and address barriers to heart healthy eating. (2/2a)
- Facilitate partnerships between communities and local/state organizations and resources such as the Department of Agriculture, Produce for Better Health, etc. (2/2a)
- Partner with the Office of Minority Health and the Center on Minority Health and Aging (Lincoln University) to form or strengthen minority community groups with an interest in health and wellness. (2a)
- Provide data on the status of minority health issues in Missouri to community groups and partners to educate and support the need for policy and environmental changes to promote healthy eating. (3a)

Rationale: It is unreasonable to expect Missourians to make dietary changes if their environment does not support these changes. The policy and environmental inventory process allows communities to critically assess the cost, availability, and convenience in obtaining heart healthy foods such as fruits and vegetables and low-fat dairy products and address the determined barriers. Potential interventions to address barriers to heart healthy eating include establishment of farmers' markets, starting a community garden, working with local restaurants to provide and identify on their menus appealing heart healthy meal options, reducing portion sizes, etc. Neighborhoods within Kansas City and St. Louis were chosen in addition to county-wide initiatives for "2a" as a more specific means of reaching the large number of African Americans in these two cities.

Evaluation: Track the number of counties/neighborhoods completing the policy and environmental inventory process. Review data from the "Special Survey" which measures individual perceptions of community policy and environmental issues in Kansas City, St. Louis, the Bootheel, some central Missouri counties, and a control area in the northwest (baseline obtained in 1999 with re-implementation planned once every three years). Obtain baseline data and continually monitor the following indicators to assess availability and access to heart healthy foods:

- presence of farmers markets, community gardens, green grocers; affordability and convenience of locations;
- percent of restaurants offering heart-healthy choices on their menus (e.g., low-fat milk, fruits/vegetables).

3. By 2005, 100% of Missouri neighborhoods/counties who have made a physical activity and/or nutrition policy or environmental change will conduct awareness activities* specific to this change.

*Awareness activities can range from brochures detailing new policies that will keep school gyms open after hours for public use, to a newspaper article featuring new lighting at the county tennis and basketball courts, to point-of-purchase information at the local grocery store, to advertisements about restaurants offering heart-healthy meals, to the mayor cutting the ribbon to open a new YMCA branch, etc.

Strategies

- Continue to offer and expand funding to all counties and targeted neighborhoods to complete the policy and environmental inventory and change process which requires promotion of these changes.
- Develop Public Service Announcements (PSAs) that can be tailored for local community use and minority populations.
- Facilitate partnerships between communities and local media outlets, churches, schools, etc. to deliver awareness messages.
- Provide technical assistance in development of appropriate and effective awareness activities.

Rationale: Awareness activities surrounding policy and environmental changes will increase the impact of the change. Informing community members about the improvements occurring in the county will further create a social environment that is conducive to being physically active and eating a healthy diet.

Evaluation: Track the number of counties/neighborhoods complementing physical activity/nutrition policy or environmental changes with awareness activities. Monitor the following indicators:

- # physical activity or nutrition-related news articles, newsletters, brochures, etc.
- # awareness-raising events

IV. Policy/Environmental Impact Objectives - Worksites

Physical Activity

1. By 2005, 25% of state government agencies will have formal policies that allow physical activity during work time.*
2. By 2005, 25% of Missouri hospitals will have formal policies that support physical activity for employees.†

*Formal policies that allow physical activity during worktime offer, for example, fifteen minutes of compensated time to be physically active.

†Formal policies that support physical activity include: subsidization of off-site exercise program/health club memberships; flex-time for employees to be physically active during the work day; incentives for walking to work, etc.

Strategies

- Determine baseline in state agencies and hospitals of the existence of formal policies supporting physical activity. (1/2)
- Partner/educate the Governor's Office on the benefits (both health and cost-savings) of physical activity for State employees. (1)
- Partner with the Missouri Hospital Association to survey and educate hospitals on the benefits (health and cost-savings) of physical activity for hospital employees. (2)
- Encourage establishment of informal policies as a step towards more formal written policies. (1/2)
- Partner with the Association for Worksite Health Promotion to gather necessary worksite benefit data and explore strategies to alter policies. (1/2)

Rationale: Missouri's workforce is comprised of over two million men and women, most of whom spend the majority of their day at the worksite. Long work hours are often cited as a barrier to adults performing physical activity. Policies that allow physical activity during work time and/or support physical activity at the worksite eliminate this barrier. State government agencies and hospitals were chosen as a focus because of the necessity to "lead by example" through adoption of these healthy policies which we hope to eventually promote in other worksites.

Evaluation: Conduct pre and post physical activity policy assessment of state government agencies. Partner with Missouri Hospital Association in reviewing data from the Annual Licensing Survey of Missouri Hospitals.

3. By 2010, establish state or local legislation which supports physical activity in worksites.

Strategies

- Investigate other state tax incentive initiatives.
- Educate state and local legislators on the benefits of worksite wellness.
- Develop draft legislation for implementation at a state or local level.

Rationale: Worksites are likely to be more inclined to implement environmental or policy changes if it directly and immediately affects their bottom line.

Evaluation: Determine State and/or number of localities implementing physical activity tax incentive legislation.

Nutrition

4. By 2005, 25% of state government office buildings with vending machines and/or cafeterias will increase by at least one their offering of fruits or vegetables or fruit or vegetable juices.
5. By 2005, 25% of state government office buildings with cold vending machines and/or cafeterias will increase by at least one their offering of low-fat dairy products (e.g., 1% or fat-free milk, low-fat yogurt, etc).

Strategies

- Inventory cafeteria and vending machine vendors to determine baseline data and perceived barriers to offering fruits and vegetables and low-fat dairy products at worksites.
- Assist vendors in the marketing of new snacks/meals through signage and promotional materials and activities to increase the demand for heart healthy food options.

Rationale: If fruits and vegetables and low-fat snack/meal options are unavailable, or there is not an adequate or appealing choice in the workplace, this presents a barrier to healthy eating given the number of individuals who spend the majority of their day in the worksite. Furthermore, in a small policy and environmental inventory of eight state government office buildings, seven were found to have an inadequate choice of healthy options in the vending machines. State government agencies were chosen as a focus because of the necessity to “lead by example” through adoption of these healthy policies which we hope to eventually promote in other worksites.

Evaluation: Implement a pre and post environmental survey of food options in state government vending machines and cafeterias.

V. Policy/Environmental Impact Objectives - Schools

Physical Activity and Nutrition

1. By 2005, 5% of Missouri elementary schools (K-8) will implement policies to increase the amount of physical activity offered during the school week.

Strategies

- Obtain baseline rates of the number of minutes per day and the number of days per week that physical education is offered in all Missouri elementary schools (K-8).
- Create a portfolio of information regarding the benefits of physical activity for students and present this information through local coalitions to school boards.
- Partner with AHA and MDHSS’s School-Aged Children Health Services Program to establish community-based awareness of need and stimulate policy changes.

Rationale: By allowing children to be inactive we increase their risk for coronary artery disease, stroke, and other cardiovascular conditions. It is critical to establish healthy behaviors in youth as it is difficult to change these behaviors in adulthood. Unfortunately, however, according to CDC, the percentage of young people who are overweight has more than doubled in the past 30 years, to which declining physical activity rates has certainly

contributed. Daily physical education can help prepare children to become active adults. Furthermore, according to a study done by Sports and Active Recreation for Kids (SPARK) at San Diego State University, additional minutes allocated to physical education do not result in decreased academic performance and, in fact, children who spent more time in physical education class scored as well or better on standardized tests than those who spent the same amount of time in another academic class.²⁹

Evaluation: Monitor information obtained by the Department of Elementary and Secondary Education on the amount of time devoted to physical activity in schools K-8th grade.

2. By 2005, at least 10% of Missouri elementary schools (K-8) will have made a policy or environmental change that fosters increased physical activity and/or healthier eating.

Strategies

- Secure funds to assist schools in making policy and environmental changes.
- Obtain baseline information on the status of policy and environmental indicators in Missouri elementary schools (K-8).
- Implement Physical Activity and Nutrition curriculum module in elementary schools, which, in addition to improving knowledge can effect environmental and policy changes such as improved access to physical activity equipment and healthy food options.
- Develop and implement a policy and environmental inventory tool that will assist schools in identifying changes that can improve students (and faculty/staff) access to a heart-healthy environment.

Rationale: As stated above, the health of children is a critical concern. More and more children are becoming obese, inactive, and are eating poorly. Children spend a good portion of their day within schools making it necessary that the policies and environments which affect them at their schools support healthy behaviors (e.g., no smoking on school grounds policies, offering healthy and appealing snack and meal options in vending machines and cafeterias, access to safe playgrounds, etc.).

Evaluation: Track the number of schools completing the school policy and environmental inventory and monitor the changes that result from the inventory process.

VI. Health Communications

Physical Activity

1. By 2005, implement a statewide physical activity integrated marketing campaign designed to increase knowledge/awareness; influence perceptions, beliefs, attitudes and social norms; prompt action; and refute myths and misconceptions about physical activity.
 - 1a. By 2005, research, design, and implement above campaign targeted toward African Americans in St. Louis, Kansas City, and the Bootheel.

Strategies

- Select and segment target audience. (1/1a)
- Conduct formative research to understand the audience's perceived benefits and barriers regarding physical activity; their readiness to become physically active; effective strategies to reach them. (1/1a)
- Based on research, develop a core marketing strategy, craft messages, and define delivery mechanisms. (1/1a)
- Evaluate a pilot campaign in select MO regions/ communities. (1/1a)
- Implement, track and evaluate full-scale campaign. (1/1a)

Rationale: In combination with other strategies, integrated marketing communications can cause sustained behavior change and overcome barriers or systemic problems. Integrated marketing communications uses both social marketing strategies which address benefits and barriers to change from the audience's perspective and health communications which focuses on crafting and delivering messages and strategies, based on consumer research, to promote the health of individuals and communities.

According to CDC, 1995 market research data indicated that millions of American adults are thinking about or starting to become physically active. Focus group and market research on this target audience revealed that these adults do not enjoy vigorous exercise, but felt that pleasant and manageable activities that are convenient would help them become more physically active. This research was conducted on a national level, therefore these issues will be explored further on a state level and include an additional focus on African Americans.

Evaluation: Monitor progress based on objectives of the campaign. Use tracking information to make needed revisions during the course of campaign implementation. Assess program impact and cost-effectiveness.

Nutrition

2. By 2002, at least 20% of Missourians will be able to identify that five servings of fruits and vegetables per day are recommended for good health.

(Baseline=14%: 1993 Missouri Nutrition Survey, n=865 respondents who consume <5 svgs of fruits/vegetables per day)

Strategies

- Utilize research, materials and media created for the Missouri Nutrition Network (MNN) and national 5-A-Day campaigns to expand and deliver the 5-A-Day message through multiple mediums at the state and local level.
- Partner with interdepartmental agencies, trade groups and grocery chains to promote the 5-A-Day message through point-of-purchase campaigns, sale ads, coupons, cooking schools, sampling, supermarket festivals, and other grocery marketing strategies.
- Assist and support the Chronic Disease Health Educators and local health departments in setting up supermarket festivals and events that promote the 5-A-Day message.

Rationale: According to a Missouri study on the knowledge, barriers and benefits of fruit and vegetable consumption, 64% of respondents found dietary recommendations confusing. And, as the baseline indicates, only 14% of those asked knew the recommended number of fruit and vegetable servings.³⁰ This suggests that more work is needed to reduce confusion and spread the 5-a-day message. Unfortunately, this data was not analyzed by race, which precludes baseline measures specifically for African Americans, however all strategies mentioned above will be tailored for implementation in African American communities.

Evaluation: Encourage addition of 5-A-Day knowledge-based question on the state-added survey section of the BRFSS.

3. By 2005, implement a statewide integrated marketing campaign designed to increase knowledge/awareness regarding lowering fat intake; influence perceptions, beliefs, attitudes and social norms; prompt action; and refute myths and misconceptions about low-fat dairy products.
 - 3a. By 2005, research, design, and implement above campaign targeted toward African Americans in St. Louis, Kansas City, and the Bootheel.

Strategies

Same as listed under Health Communications objective one.

Rationale: See rationale for an integrated marketing approach under Health Communications objective one. Furthermore, some barriers to changing to a low-fat diet have included lack of knowledge. The Missouri Nutrition Survey revealed that many Missourians find dietary recommendations confusing. Reducing this confusion through tailored development and delivery of a message regarding low-fat dairy products could lead to consumption of a diet lower in saturated fat.

Evaluation: Monitor progress based on objectives of the campaign. Use tracking information to make needed revisions during the course of campaign implementation. Assess program impact and cost-effectiveness.

VII. Health Care Services

1. By 2010, 70% of clients with CVD in Federally Qualified Health Centers (FQHCs) statewide will have their blood cholesterol, blood pressure, and blood glucose levels checked every 6 months.
2. By 2010, 70% of clients with CVD at FQHCs statewide will have documented physical activity and nutrition plans that are reviewed every six months with trained staff members.

Strategies

Partner with FQHCs to administer a new comprehensive approach intended to improve standards of care for CVD and diabetes patients. Partnership will involve:

- Provision of learning sessions to FQHC staff on CVD/diabetes issues;
- Development and testing of Public Service Announcements (PSAs) to promote usage of FQHCs;
- Creation and distribution of health communications materials regarding secondary prevention issues for FQHC clients;
- Technical assistance in maintaining and monitoring a registry of all clients.

Rationale: Federally Qualified Health Centers provide a unique opportunity to reach Missouri's high risk minority and low-income populations. Improved management of CVD is crucial in order to prevent further morbidity and potential mortality. This comprehensive approach involves a team of staff members trained to manage all aspects of CVD and diabetes. Aggressive follow-up and monitoring for all clients is possible through implementation of a registry which stores all clinical and demographic patient data.

Evaluation: Monitoring clinic registry data will be the primary means of assuring success in meeting the above objectives.

3. By 2010, increase from 31.2% to 41.2%, the percentage of adults whose doctor or health care professional has talked with them about physical activity or exercise within the past 12 months.
(Baseline: Missouri BRFSS, 1997)
4. By 2010, increase from 27.3% to 37.3%, the percentage of adults whose doctor or health care professional has talked with them about their diet or eating habits within the past 12 months.
(Baseline: Missouri BRFSS, 1997)

Strategies

- Provide professional education for the Missouri State Medical Association, the Missouri Association of Osteopathic Physicians and Surgeons, and the Missouri Nurses Association on secondary prevention of CVD through healthy eating and exercise.
- Create and distribute "Physician Alerts" and Quarterly Newsletters on the risks of a sedentary lifestyle and obesity for patients with CVD.
- Partner with the Missouri Patient Care Review Foundation to reach physicians.
- Partner with health care systems and managed care organizations to reach physicians with recommended guidelines for care of patients with CVD.

Rationale: Crucial to the prevention of an additional CVD event are exercise and a healthy diet. When stressed by a health care provider, it is more likely that a patient will practice these behaviors.

Evaluation: Monitor data from Missouri's BRFSS CVD module.

5. By 2010, partner with at least 25 worksites to implement a blood pressure and cholesterol screening program.

Strategies

- Partner with the Bureau of Health Promotion to identify effective worksite secondary screening programs.
- Pilot a CVH screening program in 5 worksites that incorporates a policy and environmental change component, in addition to screenings.
- Revise screening/policy & environment program based on pilot evaluation and disseminate the program to interested worksites, to include hospitals, schools, governmental agencies, etc.

Rationale: Worksite wellness programs have demonstrated success in improving CVH risk factors, including blood pressure and cholesterol levels among employees.³¹ Implementing screening programs in worksites willing to explore policy and environmental changes might prove an even more effective and comprehensive approach to improving the CVH outcomes for employees.

Evaluation: Monitor the number of worksites implementing the screening program. Implement program-specific tracking measures to evaluate the number of employees screened, screening results, and follow-up information.

6. By 2010, develop a consensus set of guidelines for comprehensive management of CVD patients and screening of asymptomatic patients for high cholesterol and hypertension.

Strategies

- Collaborate with United Health Care (managed care organization) through a preceptorship program which will enable both United Health Care and the State Health Department to identify common goals through an enhanced understanding of each other's strengths and limitations.
- Collaborate with peer review organizations (namely, Missouri Patient Care Review Foundation or MPCRF), through participation in MPCRF sub-committees.
- Draft, revise, disseminate and promote guidelines through partnerships with health care systems, medical schools, and insurance organizations.

Rationale: Aggressive management and screening leads to prevention of acute events. This comprehensive approach can reduce preventable complications and death associated with CVD if new standards of care are enforced.

Evaluation: Final guidelines will be the major indicator of whether or not this objective has been achieved. However, we will also monitor to whom the guidelines are distributed and gauge the response and results of guideline implementation.

VIII. Smoking

1. By 2005, secure additional funding to address smoking policy and environmental issues.

Strategies

- Advocate for proceeds from the tobacco Master Settlement Agreement to be directed toward CVD prevention through smoking policy and environmental changes.
- Assist the Tobacco Use Prevention Program in securing General Revenue funds to address tobacco use.

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2. By 2010, partner with the Missouri Tobacco Use Prevention Program to make policy and environmental changes in the counties with the ten highest rates of CVD.

Strategies

- Create a smoking-related policy and environmental community inventory similar to that used for assessment of physical activity and healthy eating barriers.
- Partner with communities to conduct policy and environmental inventories and determine and address smoking issues.
- Facilitate partnerships between communities and local/state organizations such as the Missouri Tobacco Use Prevention Program, American Cancer Society, etc.

Rationale: Currently, the CVH program and the Missouri Tobacco Use Prevention Program have separate streams of funding, which often prohibits partnership and coordinated efforts to address CVD. Furthermore, the smoking cessation and prevention efforts in Missouri are currently funded primarily through federal dollars insufficient to address the problem. Partnering with the Tobacco Use Prevention Program to secure State funding would lead to future collaborative efforts to address smoking in counties whose rates of CVD are among the highest in the State. Coordinated efforts to address smoking, physical inactivity, and poor nutrition would be the most effective methods in reducing morbidity and mortality associated with CVD.

Evaluation: Track the number of high risk counties making smoking policy and environmental changes and evaluate success of these changes.

IX. Monitoring and Evaluation

1. By 2005, produce a report on progress made towards State Plan objectives.
2. Monitor yearly BRFSS data.
3. Implement “CVH Special Survey” every two to three years (baseline administered in 1999) and produce, at minimum, one report per survey implementation detailing individual perceptions of policy and environmental conditions in relation to physical activity and nutrition status by region.
4. By June 2001 (and every 5 years thereafter), obtain a comprehensive measure of policy and environmental indicators for each Missouri county potentially including such measures as:
 - ratio of pedestrian-friendly miles/total miles assessed; number of miles of walking trails per capita or per land area; and percent malls/schools with indoor walking programs
 - ratio of community-friendly walking facilities (parks, fields, gyms) per capita or per total community area; number of facilities per capita that are open to community members, are affordable and have convenient hours of operation.
 - presence of farmers markets, community gardens, green grocers; affordability and convenience of locations;
 - percent of restaurants offering heart-healthy choices on their menus (e.g., low-fat milk, fruits/vegetables).
5. Implement statewide Obesity Reduction Survey every two to three years to maintain thorough data collection on nutrition-related issues.
6. On a yearly basis, perform process evaluation monitoring progress on all StatePlan strategies.

Strategies

- Partner with the Office of Surveillance, Research and Evaluation to assist in development of survey protocols, administration of surveys, analysis of survey results, and program evaluation efforts.

-
- Contract with Local Public Health Agencies to perform countywide assessments of policy and environmental indicators.
 - Strengthen the accountability and process evaluation of program implementation through outcomes-based contracts.

Rationale: In order to appropriately gauge progress, it will be necessary to institute all of the above measures. These evaluation measures will further direct CVD efforts statewide.

Evaluation: These objectives can be monitored through evidence of reports appropriate to each of the surveys and measures detailed above.

Appendix A
Summary of Phase I Policy/Environmental Interventions in Local Government

County	Policy/Environmental Barrier	Project Plan/Activities
Clark	Lack of outdoor areas for exercise in Kahoka, MO	<ul style="list-style-type: none"> Established Clark County Physical Activity Promotion Coalition. Determined site for city walking path to accommodate children who walk to school, senior housing residents who walk uptown, and ensured a scenic site to draw other residents to use the path. Purchased signs to demarcate the path, however will need to pursue additional and fairly substantial funding (possibly from DNR) to allow for repair, replacement, and establishment of new sidewalks along the designated path. Coalition is considering ways to promote path usage by tying in to community events and utilizing local media.
Douglas	Insufficient choice and identification of heart healthy meal options in Ava, MO restaurants	<ul style="list-style-type: none"> The Douglas County CHART, in cooperation with the AHA, provided a heart healthy cooking workshop for staff of two sit-down restaurants in Ava. Heart Healthy Cookbooks were distributed to 37 cooks at area restaurants. Restaurants were offered the opportunity to have a free ad placed in the local newspaper if they added a healthy choice to their current menu or identified existing healthy choices (7 ads were placed). Promotional items (jar grippers) were given to restaurants to distribute to customers who ordered a heart healthy meal option (480 distributed between July and September).
Dunklin	Lack of parks where you can walk, run or bike	<ul style="list-style-type: none"> The AHA coalition collaborated with the Kennett Park Board to improve two existing walking trails in Kennett, MO as it was deemed that current funding would be insufficient to establish a new walking trail in one of the parks. Mile marker signs with physical activity messages were purchased for both Jones Park Walking Trail and the Willoughby Park Walking Trail. An entrance sign for the Jones Park Walking Trail was also purchased (Willoughby already has one). The coalition plans to order more chat for the maintenance of the Willoughby Park Walking Trail. Once mile markers are in place and the additional chat is down, newspapers will be contacted to run articles informing the community of the trail improvements and designating these trails as the "Official Walking Trails of Kennett."
Marion	Unhealthy snacks in employee lounge vending machines in Hannibal Public School District	<ul style="list-style-type: none"> The NE MO CHART Wellness Task Force identified unhealthy vending machine snacks in areas schools as their p/e barrier. Support has been obtained by school administration to provide healthy snacks in vending machines and diet and exercise information in employee lounges in Hannibal School District. Staff are determining the healthy snack options. To evaluate, vending machine suppliers will provide information on the snack choices of employees to see the percentage of sales accounted for by the healthy items.

County	Policy/Environmental Barrier	Project Plan/Activities
Mercer	Lack of parks where you can walk, run or bike	<ul style="list-style-type: none"> • A Mercer Park Board was formed to develop land that was donated to the city into a community park that will include a walking trail. • As this is a major financial undertaking, the coalition is working with the Rural Community Foundation who is providing assistance in researching funding opportunities and apply for grants. • A Mercer Park brochure was developed to create awareness about the Park Board and to begin to garner support to establish a Park.
Monroe	Lack of walking/biking trails and/or no public indoor exercise facilities (handicap accessibility for both is a concern as no handicap accessible trails or facilities are located close by)	<ul style="list-style-type: none"> • The CHART Wellness Task Force surveyed 105 community members and determined that many residents want, and say they would use, a walking trail. • The coalition collaborated with the City Superintendent of Paris, MO who is coordinating services and materials to build a handicapped accessible walking trail with a multipurpose building near the Paris fairgrounds. • Currently, there are no provisions for amenities such as signage, water fountains, benches, or bulletin boards for health and fitness messages and events. • The coalition is partnering with the boy scouts who have agreed to build signs to mark miles on the trail.
Oregon	Senior Centers not centrally located—people unaware of healthy eating and physical activity opportunities at the centers	<ul style="list-style-type: none"> • The CHART group surveyed community members in two Oregon County cities (Alton and Thayer) and determined that many people are unaware of the local senior centers which provide nutritious meals and offer exercise equipment and exercise classes (e.g., PACE) for seniors. • Two billboards were developed (one for Alton and one for Thayer) to advertise senior center services and provide directions. Billboards will be placed in highly visible locations in each town.
Polk	Lack of walking trails	<ul style="list-style-type: none"> • The community coalition of Morrisville determined the need for a walking site. • The School Superintendent obtained approval from the school board to develop a site around the school buildings. • The site forms a one mile square around the buildings. • Mile markers have been placed along the walking path and the Industrial Arts teacher and his students are building a starting sign frame and stretching bench. • The school nurse established a walking program for staff/faculty. • The art students made signs promoting walking that will be displayed in the school and at the local restaurant and grocer. • A newsletter was published to promote the walking trail and the local media has published articles on the path. • The Mayor has encouraged community participation and helped install the mile markers.

County	Policy/Environmental Barrier	Project Plan/Activities
Pulaski	No indoor facilities for physical activity; unsupportive policies	<ul style="list-style-type: none"> • A community coalition was formed and decided to focus efforts in Swedeborg where physical inactivity and unhealthy eating were found to be especially concerning. • The Swedeborg School Principal (coalition member) discussed the opportunity to use the new school gym which should be ready by the end of September to have aerobics classes and house a small fitness facility for the Swedeborg community. • Exercise equipment was purchased and physical activity programs have been planned for the new facility. • Policy changes include allowing Swedeborg School staff to exercise for 20 minutes per day, three days per week. • A physical activity and nutrition program will be implemented for the community using the new facility.
Ralls	No public indoor facilities for physical activity	<ul style="list-style-type: none"> • The Wellness Task Force designated the lack of public indoor facilities as a barrier to physical activity in Ralls County and pursued use of elementary school gyms for use by community members. • The Ralls County R-II School Superintendent and the school principals in three towns in Ralls County gave permission for use of school gymnasiums as indoor facilities for adult physical activity.
Reynolds	Insufficient healthy menu options at local restaurant	<ul style="list-style-type: none"> • The CARES coalition has included in its focus changing the menu of the one sit-down restaurant in Ellington, MO to include more healthy choices. • The Reynolds County Health Educator and the Health Center dietician met with the owner of the restaurant to discuss additions and/or changes to the menu to include healthier choices. • The dietician prepared a list of possible changes that could be made without increasing the cost of preparation for the restaurant. • CARES would like to fund some publicity and promotional items such as place mats and menu markers.
Webster	Lack of indoor facilities for physical activity	<ul style="list-style-type: none"> • To address the lack of indoor facilities for physical activity, the Wellness Task Force decided to support a current effort of building a YMCA branch in Marshfield, MO. • Exploratory meetings with community members and results of a community survey demonstrated support for pursuing establishment of a YMCA branch that could house an indoor swimming pool, indoor track, aerobic classes, weight training equipment, etc. • Meetings were held with the CEO of the YMCAs in Springfield who gave us an outline of the steps necessary for steering committee formation, fundraising activities (an estimated \$200,000 is necessary), and further community surveys. • A list of possible steering committee members has been developed to further the process of YMCA promotion in Webster County. • Future fundraising activities will include grant writing and direct requests from community members.

Appendix B

Community Policy and Environmental Inventory



Cardiovascular Health

Bureau of Chronic
Disease Control

Not applicable/

Physical Activity

- | | <i>Yes</i> | <i>No</i> | <i>Not sure</i> |
|--|--------------------------|--------------------------|--------------------------|
| 1. Thinking about traffic, is it safe to walk, run or bike in your community? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Thinking about criminal activity, is it safe to walk, run or bike in your community? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Is it pleasant to walk, run or bike in your community (enough trees, no graffiti, no abandoned buildings, proper lighting, etc.)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Are there sidewalks in most areas of your community? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Are there working crosswalk signals at busy intersections? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Are there any walking or biking trails in your community? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6a. If YES , are the trails a safe, pleasant, and convenient place to be physically active (e.g., well-lit, clean, adequately maintained, suitably located, morning/evening hours available, etc.)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Are there any parks in the community where you can walk, run or bike? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7a. If YES , are the parks a safe, pleasant, and convenient place to be physically active (e.g., well-lit, clean, adequately maintained, suitably located, morning/evening hours available, etc.)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Do you have access to <i>public</i> outdoor exercise facilities (e.g., tracks, tennis courts, swimming pools)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8a. If YES , are these facilities a safe, pleasant, and convenient place to be physically active (e.g., well-lit, clean, adequately maintained, suitably located, morning/evening hours available, etc.)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Do you have access to <i>public</i> indoor facilities such as school gyms? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9a. If YES , are these facilities a safe, pleasant, and convenient place to be physically active (e.g., well-lit, clean, adequately maintained, suitably located, morning/evening hours available, etc.)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Are <i>private</i> facilities for physical activity (e.g., private gyms or fitness clubs) available in the community? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10a. If YES , is the membership fee affordable? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Nutrition

- | | | | |
|---|--------------------------|--------------------------|--------------------------|
| 11. Are fresh fruits and vegetables readily available in the community year-round? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Are fruits and vegetables affordable? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Do most sit-down restaurants in the community offer and/or identify healthy choices on their menus? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Out of all the questions to which you answered "no," circle the number of the one you would most like to see addressed in the community. Please circle only one.

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